Problem Wk.11.1.2: Transition Models

In this problem, we look at defining transition models. It is important to read the Design Lab 11 handout before you start this problem.

Look at the software documentation for the `dist` module. Throughput this problem, the `dist` module has been imported, so you can get at all the contents by using `dist.x`.

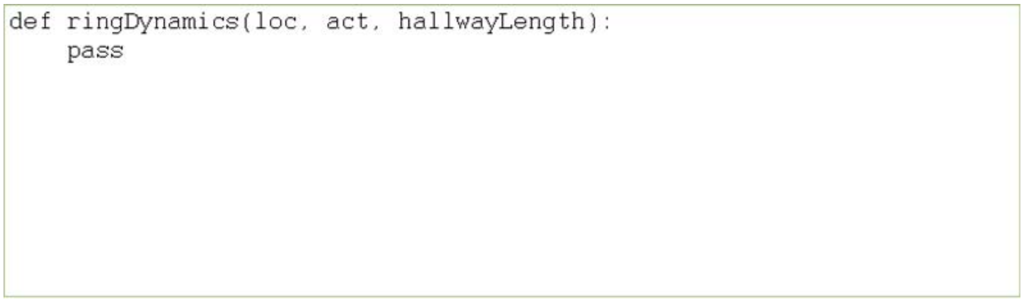
In your answers, feel free to define any auxiliary functions that you may need.

The following useful function is already defined:

```
def incrDictEntry(d, k, v):
    if d.has_key(k):
        d[k] += v
    else:
        d[k] = v
```

Part 1: Living on a donut

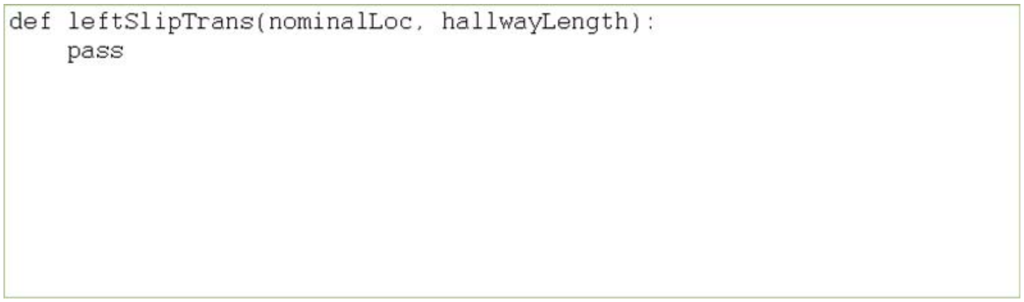
Write a ``ring'' dynamics model, in which the room 0 is connected to room `hallwayLength-1`.



```
def ringDynamics(loc, act, hallwayLength):
    pass
```

Part 2: Slipping to the left

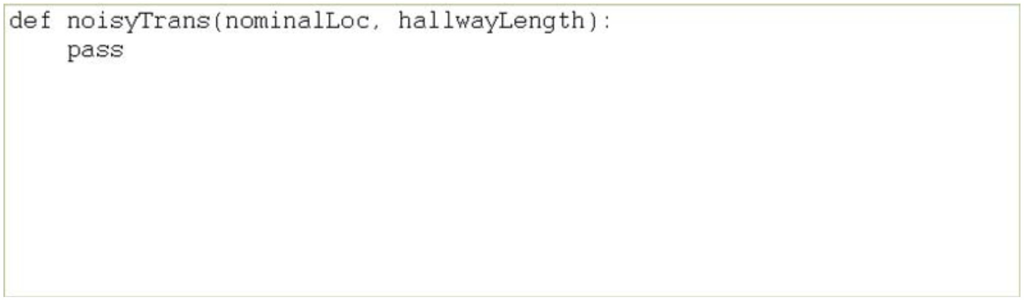
Write the *left slip* noise model, in which, with probability 0.1, the robot lands one square to the **left** of its nominal location and otherwise lands at its nominal location. It should not be allowed to transition off the end of the world, though: if it is nominally at the leftmost location, it should stay there with probability 1.



```
def leftSlipTrans(nominalLoc, hallwayLength):
    pass
```

Part 3: Noisy Transitions

Write a transition noise model in which the robot lands one square to the left of where it should be with probability 0.1, one square to the right with probability 0.1, and in the nominal square with probability 0.8. It should not be allowed to transition off either end of the world; any probability associated with a square off the end of the hallway should be associated instead with the square at that end of the hallway.

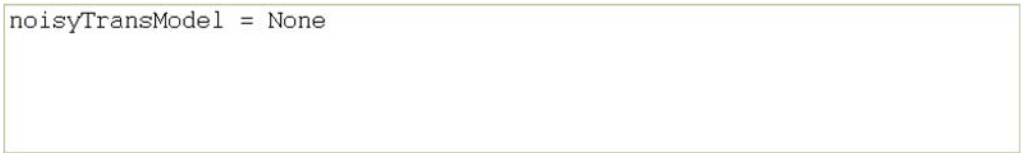


```
def noisyTrans(nominalLoc, hallwayLength):
    pass
```

Part 4: Transition Models

The function `makeTransitionModel`, described in the handout, puts together the dynamics and noise model to construct a full transition model for a hallway of a given length.

Enter the expression for creating the full transition model for the `standardDynamics` and the `noisyTrans` (assume it's already defined) in the `standardHallway` (assume it's already defined) which is 5 squares long.



```
noisyTransModel = None
```